



Spectral Gamma-Ray Borehole
Log Data Report

Page 1 of 3

Borehole

41-07-07

Log Event A

Borehole Information

Farm : <u>SX</u>	Tank : <u>SX-107</u>	Site Number : <u>299-W23-77</u>
N-Coord : <u>35,302</u>	W-Coord : <u>75,681</u>	TOC Elevation : <u>663.31</u>
Water Level, ft :	Date Drilled : <u>2/21/1962</u>	

Casing Record

Type : <u>Steel-welded</u>	Thickness : <u>0.280</u>	ID, in. : <u>6</u>
Top Depth, ft. : <u>0</u>	Bottom Depth, ft. : <u>75</u>	

Equipment Information

Logging System : <u>2</u>	Detector Type : <u>HPGe</u>	Detector Efficiency: <u>35.0 %</u>
Calibration Date : <u>03/1995</u>	Calibration Reference : <u>GJPO-HAN-1</u>	

Logging Information

Log Run Number : <u>1</u>	Log Run Date : <u>6/1/1995</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>0.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>N</u>
Finish Depth, ft. : <u>74.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>2</u>	Log Run Date : <u>6/2/1995</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>50.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>Y</u>
Finish Depth, ft. : <u>54.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Log Run Number : <u>3</u>	Log Run Date : <u>6/2/1995</u>	Logging Engineer: <u>Mike Widdop</u>
Start Depth, ft.: <u>70.0</u>	Counting Time, sec.: <u>100</u>	L/R : <u>L</u> Shield : <u>Y</u>
Finish Depth, ft. : <u>66.5</u>	MSA Interval, ft. : <u>0.5</u>	Log Speed, ft/min.: <u>n/a</u>

Borehole

41-07-07**Log Event A**

Analysis Information

Analyst : S.E. KosData Processing Reference : Data Analysis Manual Ver. 1Analysis Date : 10/4/1995**Analysis Notes :**

This borehole was logged in three logging runs. Because of high count rate and resulting detector saturation, several log runs were necessary to bracket the high-count-rate zone and to log it with a shielded detector. Pre- and post- verification spectra indicate that the logging system was operating properly. The energy drift was minimal during the log runs, and additional energy calibrations beyond the pre- and post- energy calibrations were not required to process the data.

Because of field size limitations in the data base, logging run 1 is shown to start at ground surface and end at a depth of 74.5 ft. Run 1 actually consisted of two logging runs, one from 74.5 to 68 ft, and the other from ground surface to 52 ft.

The casing thickness is 5/16 in. (0.3125 in.). The casing correction used to process the data was for 0.33-in.-thick casing; therefore, a slight over-estimation of radionuclide concentration was calculated. The borehole was dry; no water correction was required. A shield correction was applied to the log runs where a shield was installed on the detector.

The only man-made radionuclide identified was Cs-137, and it was detected throughout the borehole. The count rate saturated the detector from 54.5 to 67 ft. The maximum activity of about 400 pCi/g was measured at 67 ft, immediately below the detector-saturation zone.

The discrepancies observed in the repeatability between the shielded and unshielded logging runs may be caused by a depth difference between the logging runs. A small depth difference could cause the discrepancies observed.

Additional details regarding interpretation of the data for this borehole are provided in the Tank Summary Data Report for tank SX-107.

Log Plot Notes:

Three log plots are provided. The Cs-137 activity is plotted on a separate plot to provide details of activity and distribution.

The natural gamma-ray logs show the activities of the naturally occurring radionuclides potassium (K-40), uranium (U-238), and thorium (Th-232). The KUT plot is provided to allow correlation of lithologic features between boreholes. The KUT activities observed in this borehole are typical for Hanford Site sediments.

A combination plot incorporates the Cs-137 and KUT log data with the total gamma-ray count rate derived from the spectral gamma-ray data and gross gamma-ray data acquired with the WHC Tank Farm gross gamma-ray logging systems. This plot allows correlation of the Cs-137 contamination zones with lithologic features and with the gross gamma-ray historic record.

The statistical uncertainty in a measurement is represented on the log plots by uncertainty bars where

Borehole

41-07-07

Log Event A

appropriate. This uncertainty is reported at the 95-percent confidence interval. The minimum detectable activity (MDA) of a radionuclide represents the lowest activity at which positive identification of a gamma-ray peak is statistically defensible. The MDA values are indicated on the log plots by open circles. If the reported activity is slightly above the MDA, the 95-percent confidence interval may extend below the MDA value and the measurement cannot be stated with 95-percent confidence.

The Tank Farm gross gamma-ray plot is produced from the most recent data available from WHC. No corrections other than scale adjustments for plotting have been made to the data. The plot is generated from data acquired with the low efficiency detector. As a result, only the high gamma-ray activity is recorded; the low gamma-ray activity is recorded as zero.